

REMARKS

Claims 20-33 are pending in the application. Claims 21 and 22 have been cancelled, and claims 20 and 23 have been amended to overcome Examiners rejections under U.S.C. 103.

CLAIM REJECTION UNDER 35 U.S.C. 103

Before embarking on a discussion of Examiners specific rejections of the claims under 35 U.S.C. 103(a), Applicant believes that some preliminary comments are in order.

With respect to Applicants' independent claim 20, Examiner states that while Tsubota et al. does not disclose a second substrate having a reflective character, it is notoriously well known in the liquid crystal art to make a substrate reflective in order to obtain a reflective display and thus rejects independent claim 20 under 35 U.S.C. 103(a) as obvious in view of the Tsubota et al. reference.

In support of Examiners rejection of claim 20 as obvious in view of JP 56-85731 (Koichi), Examiner states that Koichi does not explicitly disclose a second substrate having a reflective character, but again states that is notoriously well known in the liquid crystal art to make a substrate reflective in order to obtain a reflective display.

With respect to Examiners rejection of claims 21 and 22 under 35 U.S.C. 103 in view of Koichi, Examiner states that even though Koichi does not explicitly show the alignment layers, it is common and known in the art to employ alignment layers in a liquid crystal display to align liquid crystal molecules.

With respect to claim 24, Examiner states that depositing a conductive coating without patterning on a bottom surface of a substrate is common and known in the liquid crystal art and that it is desirable in the liquid crystal art to reduce manufacturing steps and thus reduce cost.

In rejecting claims 27-31 under 35 U.S.C. 103(a), Examiner states that positioning two substrates using pressed assembly techniques such as aligning the substrates between a first plate and a bladder of a second plate, placing a shim plate of flexible material between a bladder and the one of the substrates and inflating the bladder is known in the art and thus would have been obvious.

As to claims 32 and 33, Examiner states that positioning two substrates by using a bag full of gas and evacuating the gas by drawing a vacuum in the bag is common and known in the art and thus would have been obvious.

Finally, in rejecting claims 25 and 26 under 35 U.S.C. 103(a), Examiner concludes that coating the plurality of spacers with a sealing material is common and known in the art and thus would have been obvious.

With respect to all of the above, Examiner has not supported any of his conclusions with a single reference. Therefore, Applicant respectfully submits that Examiner has not established a prima facie case of obviousness for the following reasons.

Examiner has the burden of proving factual support for any prima facie conclusion of obviousness. To reach a proper determination of obviousness under 35 U.S.C. 103, Examiner is required to step back in time and determine that the claimed invention as a whole would have been obvious at the time to a person of ordinary skill in the art just before the invention was made. Examiner cannot rely on Applicants' disclosure to reach this determination, impermissible hindsight must be avoided, and the conclusions of obviousness must be reached on the basis of facts in the prior art.

Examiner is well aware of the three basic criteria necessary to establish a prima facie case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success, and third, the prior art reference or references must teach or suggest all the claim limitations. The teachings or suggestion to make the combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. In re Vaack, 947 Fed. 2d 488, 20 USPQ 2d, 1438. Applicants therefore very respectfully submit that Examiner has not met the criteria for establishing a prima facie case of obviousness.

The following comments are directed to Examiner's specific rejections of the claims. In Paragraph 2 of the Office Action, Examiner rejects independent claim 20 under 35 U.S.C. 103(a) as being unpatentable over Tsubota et al. Examiner states that Tsubota discloses a liquid crystal display comprising a first substrate having an optically transmissive character, a second substrate positioned adjacent to the first substrate and

having an active area bordered by a perimeter seal area, a plurality of spacers configured about the perimeter seal area of the second substrate such that the first substrate is separated from the second substrate by the plurality of spacers to form a cell gap, and a liquid crystal material positioned in the cell gap between the first and second substrates, wherein each of the plurality of spacers are restricted to a location outside the active area. As stated previously, Examiner states that while Tsubota et al. does not disclose a second substrate having a reflective character, it is notoriously well known in the art to make a substrate reflective.

Applicants' independent claim 20 has been amended to specifically recite a method for making a liquid crystal display comprising... providing at least one cross-over between the first substrate and the second substrate. Tsubota et al. neither teaches nor suggests the step of providing such a cross-over. Therefore, it is respectfully submitted that Applicants' amended independent claim 20 distinguishes over and is unobvious in view of the Tsubota et al. reference.

In Paragraph 4 of the Office Action, Examiner reject claims 20-24 and 27-33 under 35 U.S.C. 103(a) as being unpatentable over Koichi in view of Tsubota et al. As already discussed and admitted by Examiner, Koichi does not disclose a second substrate having a reflective character. Furthermore, however, Koichi does not teach or suggest the step of providing a cross-over connection between the first substrate and the second substrate. Therefore, it is respectfully submitted that Applicants' amended independent claim 20 distinguishes over and is unobvious in view of the Koichi and Tsubota et al. references taken singly or in valid combination.

Examiner next rejects claims 21 and 22 stating that Koichi shows in FIG. 4 that the display further comprises cross-over means 17 for communicating directly between the first substrate 12 and the second substrate 11. Claims 21 and 22 have been cancelled and Applicants' independent claim 20 amended, as previously described, to recite the step of providing at least one cross-over between the first substrate and the second substrate. Applicants' respectfully disagree with Examiner's conclusion that Koichi shows in FIG. 4 a cross-over means 17 for communicating directly between the first substrate 12 and the second substrate 11. Referring to page 20 of Applicants' specification, Applicants state that a cross-over may be thought of as an adhesive material

or epoxy into which conductive material is disbursed so as to aid in creating an electrical path between the reflection mode display circuitry that resides below the reflective pixel layer of the wafer and the conductive coating layer attached to the glass cover. In other words, the cross-over material 170 communicates the cover glass drive voltage from the reflective pixel layer 125 of wafer 115 to conductive coating 130 of substrate 100.

Conventionally, the cross-over material is made of silver particles or gold-coated plastic particles. Koichi states that the purpose of his invention is to illuminate deficiencies of liquid crystal display devices according to the prior art by controlling the thickness of the liquid crystal layer using bumps formed on the silicon substrate. He refers to these bumps as 14 and 15 on the silicon substrate. Koichi goes on to state that when it is desirable to maintain a constant thickness of the liquid crystal layer along the entire surface of the liquid crystal display, the bumps can be disbursed also into the region of the liquid crystal display as is shown in FIG. 3. He states that the bumps formed in the region of the liquid crystal display are represented by the number 17. Koichi also states that bumps 17 must not be conductive with respect to the silicon substrate. Clearly, this does not correspond to the cross-overs in Applicants' amended independent claim 20. Therefore, Applicants' amended independent claim 20 is believed to distinguish over and be unobvious in view of the cited references taken singly or in combination.

Examiner's rejection of claims 23, 24, 27-31, 32, and 33 have already been discussed. It is further submitted, however, that these claims are believed to properly depend, either directly or indirectly, from Applicants' amended independent claim 20 and are believed allowable therewith.

Examiner's note on the top of page 6 of the Office Action is somewhat confusing to Applicants. Examiner states that the method of positioning the substrates described in claims 27-31 and 32-33 are considered as obvious variations and thus are not patentably distinct. Examiner suggests that if Applicants disagree with Examiner's position, Applicants are reminded that a restriction between claims 27 and 32 might be proper. However, in the previous Office Action dated April 9, 2002, Examiner indicated that claims 20-23 corresponded to a single specie. Clarification is respectfully requested.

In Paragraph 6 of the Office Action, Examiner rejects claims 25 and 26 under 35 U.S.C. 103(a) as being unpatentable over Koichi in view of Tsubota et al. In addition to

Applicants' remarks above with regard to Examiners rejections of claims 25 and 26, Applicants respectfully submit that claims 25 and 26 depend, either directly or indirectly, from Applicants' amended independent claim 20 and are believed allowable therewith.

CONCLUSION

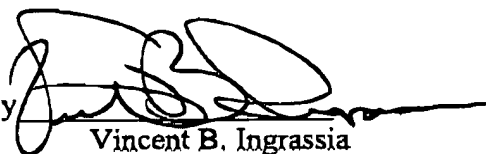
In view of the Applicants' remarks, Examiner's rejections under 35 U.S.C. 103 are believed overcome. Accordingly, Applicants submit that the present application is in condition for allowance and requests that Examiner pass the case to issue at the earliest convenience. Should Examiner have any questions or wish to further discuss this application, Applicants request that Examiner contact the undersigned at (480) 385-5060.

If for some reason Applicants have not requested a sufficient extension and/or has not paid a sufficient fee for this response and/or for any extension necessary to prevent abandonment of this application, please consider this as a request for an extension for the required time period and/or authorization to charge our deposit account 50-2363 for any fee which may be due.

Respectfully submitted,

Date:

By



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VERSION OF CLAIMS SHOWING ALL CHANGES MADE

20. (Amended) A method of making a liquid crystal display, comprising;
~~providing a first substrate having an optically transmissive character;~~
 providing a second substrate having a reflective character and an active area
 bordered by a perimeter seal area;
 configuring a plurality of spacers about the perimeter seal area of the second
 substrate;
 positioning the second substrate adjacent to the first substrate so that the second
 substrate is separated from the first substrate by the plurality of spacers so as
 to form a cell gap; [and]
 positioning a liquid crystal material in the cell gap between the first substrate and
 the second substrate; and
providing at least one cross-over between the first substrate and the second
substrate.

Cancel claim 21.

Cancel claim 22.

23. (Amended) The method of claim [22] 20 further comprising;
 disposing a first alignment layer on the bottom surface of the first substrate;
 disposing a second alignment layer on the top surface of the second substrate,
 wherein the top surface of the second substrate is complementary to the
 bottom surface of the first substrate; and
 piercing the at least one cross-over through the first alignment layer and the
 second alignment layer.